


Michigan DEQ Water and Wastewater Security Program



Vulnerability Assessments & Emergency Preparedness



A photograph taken from the International Space Station (ISS) showing a view of Earth. The Earth's surface is covered in a dense layer of white clouds, with a large, dark blue area of water visible in the center. The horizon of the Earth is visible in the distance. The ISS structure, including various modules and equipment, is visible in the foreground on the left side of the image.

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State of Michigan
Department of
Environmental Quality

[Bad News]

- Wastewater Security Program
- There is none!

[Good News]

- You are great !

Wastewater Security Summary

- 1. our greatest strength is our greatest weakness
- 2. more people...what kind
- 3. contact drinking water staff if sewage treatment plant has toxicity/upsets
- 4. 9 elements of a security program
- 5. Sen. Jeffords bill: \$265 M
- 6. TTXs: tabletop exercises
- 7. use contingency plan to train EOC, first responders – police, fire departments
- 8. 800 mhz radios in lieu of phones

Wastewater Security Summary II

- 9. isolate/contain/investigate/remediate if toxicity
- 10. reverse 911 to call public
- 11. civil support teams for WMD
- 12. FEMA NIMS 700 & 800 compliant for grants from DHS
 - FLOPA acronym



Department of Environmental Quality



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A A

Water and Wastewater Security

Due to terrorist attacks on September 11, 2001, and recent federal legislation and state authorizations, the Michigan Department of Environmental Quality (MDEQ), Water Bureau (WB), actively participates in numerous Infrastructure Security Program activities. The federal Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Bioterrorism Act) requires drinking water systems to comply with requirements by certain dates as a part of the nation's homeland security efforts.



Here is an introductory powerpoint presentation ([PPI 6MB](#) or [PDE 5MB](#)) outlining the major challenges of Water and Wastewater Security.

Here is a powerpoint presentation ([PPI 6MB](#) or [PDE 4MB](#)) outlining recent tabletop exercises at Water and Wastewater facilities around Michigan.

Here is a powerpoint presentation ([PPI 3MB](#) or [PDE 4MB](#)) outlining population growth in the world, the United States, and Michigan.

Announcements

- 21 Dec 05: DHS chemical plant regulation bill introduced. > [View Story](#)
- 14 Dec 05: Senator James Jeffords introduces federal wastewater security bill. > [Press Release](#)

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Emergency Response for Releases to Water

Introduction to the Part 5 Rules - Spillage of Oil and Polluting Materials.



The Water Bureau is responsible for implementing the Part 5 Rules - Spillage of Oil and Polluting Materials. The revised Part 5 Rules were made effective August 31, 2001. The Part 5 Rules deal with the storage and release of oil, salt, and polluting materials. Such issues as threshold management quantities, Pollution Incident Prevention Plans (PIPPs), secondary containment, threshold reporting quantities, spill reporting, surveillance of manufacturing processes, treatment systems, and storage areas are described. The entire Part 5 Rules can be downloaded from this web page under "Laws and Rules".

Here is an introductory powerpoint presentation ([PPI 6MB](#) or [PDF 2MB](#)) about the Part 5 rules.

Information

- [Water Emergency Response to Releases](#) [PDF](#)
- [Water Bureau Part 5 Rules/PIPP Staff](#) [PDF](#)
- [Part 5 Rules Operational Guidance Index](#)
- [Emergency Response Photo Gallery](#)
- [Part 5 Rules Information Package: summary of changes, facilities](#)

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[Heroes

]

■ Let's

[Heroes

]

■ Roll

[Todd Beamer]



“Let’s Roll!”

- Nobody knows the courage, importance and impact of the sacrifices made by Todd Beamer, Jeffery Glick, Thomas Burnett Jr., and others aboard United Airlines Flight 93, Sept 11th, 2001
- Apparently the terrorists planned to crash the plane into the U.S. Capitol or White House



Todd Beamer



[Heroes]

- We should know
and not forget
our heroes

[Human Longevity]

- An unsolicited testimony from an epidemiologist indicated the main reason for the dramatic increase in human lifespan over the last 100 years is due to the improvement in the treatment of drinking water and wastewater.



[Wastewater program]

- Our greatest strength is our greatest weakness

Hurricane Katrina: we can't
predict...but, we can prepare



What is your community's scariest emergency?...new utility paradigm

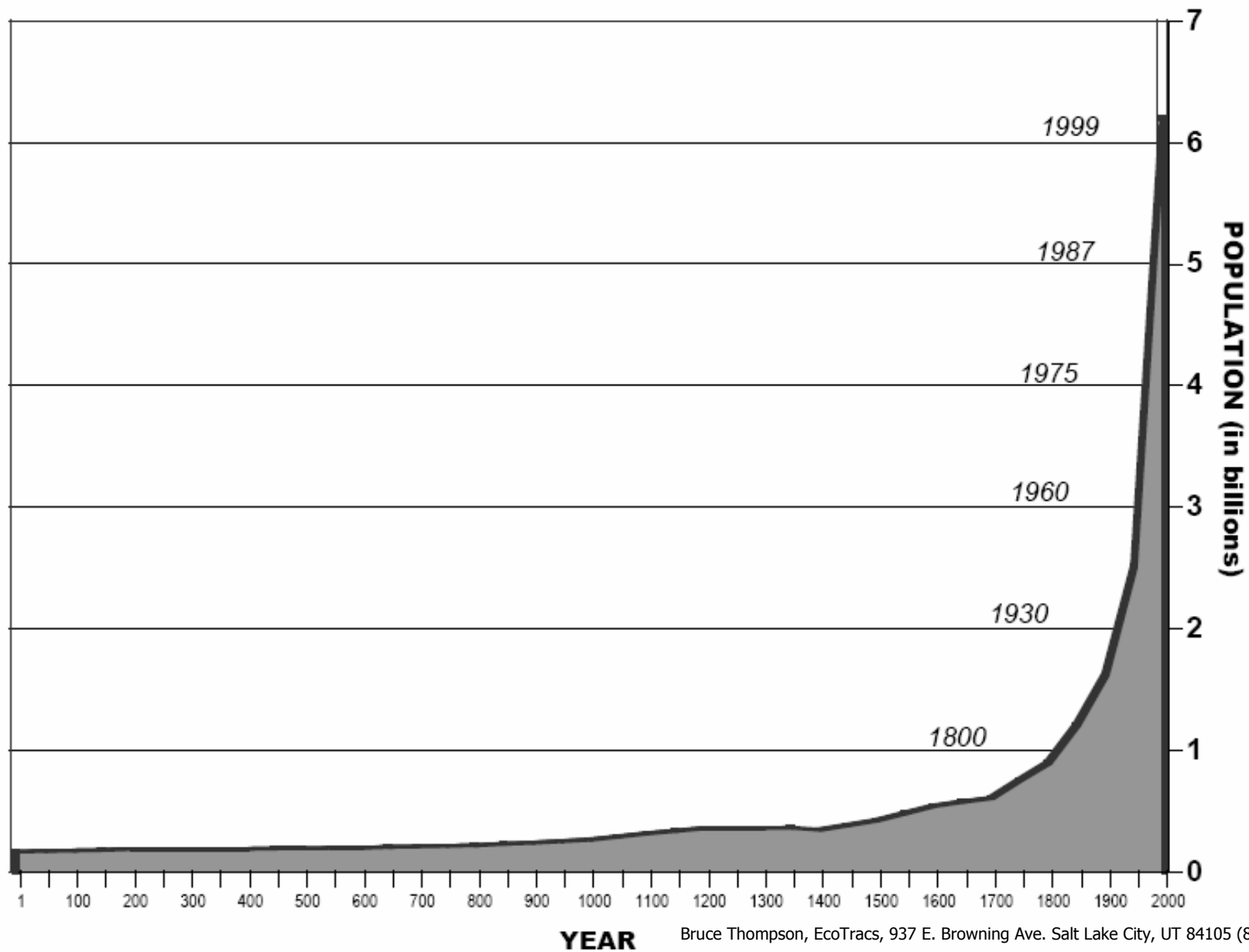
- Malevolent acts...what are they?
 - Malevolent: 'wishing evil or harm to others; having or showing ill will'
 - What is in the hearts and minds of people?
- CBRNE and cyber
 - CBRNE: chemical, biological, radiological, nuclear, explosive
 - Cyber: computer / systems terrorism



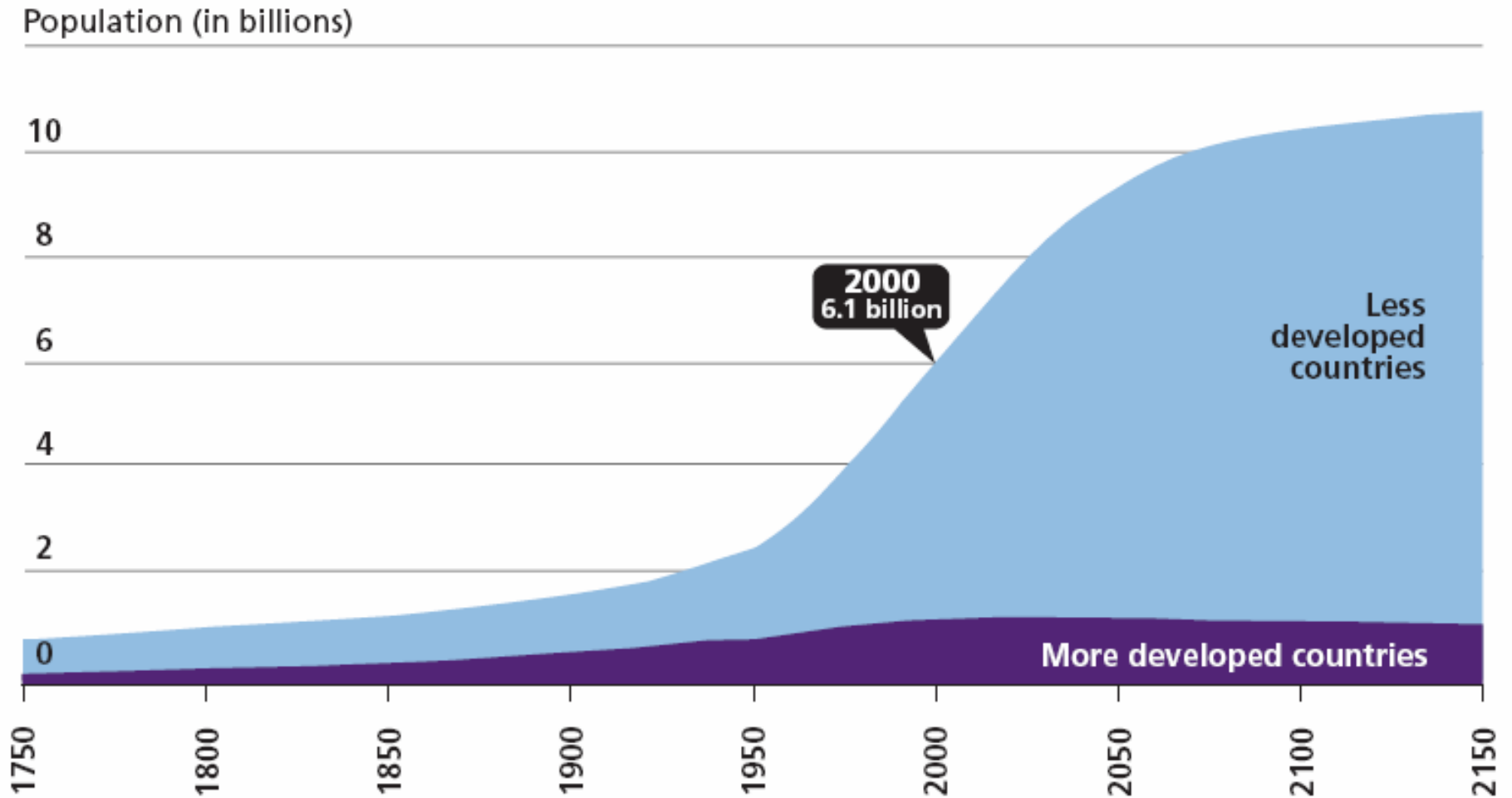
[Population]

- MORE PEOPLE
- WHAT KIND OF PEOPLE ?

Human Population Growth Since 1 A.D.



World population growth, 1750-2150



United Nations, *World Population Prospects, The 1998 Revision* (New York: UN, 1998); and estimates by the Population Reference Bureau.

[Human Water Consumption]

- 64 ounces of water per day recommended
- body is approximately 65 % water

Security = CIP 3

- Capital Improvement Plan
- Continuous Improvement Program
- Critical Infrastructure Protection

Water and Wastewater security elements

- (1) the purchase and installation of equipment for detection of intruders;
- (2) the purchase and installation of fencing, gating, lighting, or security cameras;
- (3) the tamper-proofing of manhole covers, lift stations, and remote facilities;
- (4) the re-keying of doors and locks;

Water and Wastewater Security Elements (cont'd)

- (5) improvements to electronic, computer, or other automated systems and remote security systems;
- (6) participation in training programs, and the purchase of training manuals and guidance materials, relating to security against terrorist attacks;
- (7) improvements in the use, storage, or handling of various chemicals; and
- (8) security screening of employees or contractor support services.

[Most Important and least expensive security measure]

- Change practices, policies and procedures that would enhance security.

Questions

- Are you subject to new information? At what speed?...yes...186,000 miles per second
- How long will you have to have to upgrade your computer system's virus protection?...for the foreseeable future
- Are issues that are higher on the ladder of abstraction more important?...yes, e.g., security

Wastewater Treatment Security Bill: CWA amendment

- Senator Jim Jeffords, (I-VT)
- 11/10/05 introduced: \$265 M
- Funding: max \$150 K per facility
 - Vulnerability Assessments (VAs), Site Security Plans, Emergency Response Plans (ERPs)
 - Security Enhancements
- voluntary ?

WWTS bill: funding/security enhancements

- delay, and detection of intruders and hazardous or dangerous substances, including:
 - “(i) barriers, fencing, and gates;
 - “(ii) security lighting and cameras;
 - “(iii) metal grates, wire mesh, and outfall entry barriers;

WWTS bill funding/security enhancements (cont'd)

- “(iv) securing of manhole covers and fill and vent pipes;
- “(v) installation and rekeying of doors and locks; and
- “(vi) smoke, chemical, and explosive mixture detection systems;

WWTS bill: funding/security enhancements (cont'd)

- “the conduct of activities to improve
- the security of electronic, computer, or other automated systems and remote security systems, including—
 - “(i) controlling access to those systems;
 - “(ii) intrusion detection and prevention; and
 - “(iii) system backup; and

[WWTS bill funding/security enhancements (cont'd)]

- “participation in training programs,
- and the purchase of training manuals and guidance material, relating to security.

[Technology]

- Technology: generally inexpensive capital costs
- Internet: information segueing to the web
- Real time water quality monitoring a part of wastewater treatment plant's SCADA (supervisory control and data acquisition) system; more graphical vs individual numerics

[Homeland Security Presidential Directive (HSPD) # 9...[1/30/04]

- “...This effort will include countermeasure research and development of new methods for detection, prevention technologies, agent characterization, and dose response relationships for high-consequence agents in the food and ***the water supply***. (emphasis added)
”
...

[Security Funding]

- Dept of Homeland Security
- US Environmental Protection Agency
- Dept of Health and Human Services
 - Center for Disease Control
- other

Wastewater Treatment Security bill:

- Vulnerability Assessments (VA) and Emergency Response Plans (ERP)
- Voluntary ??



What is a Vulnerability Assessment?

- Vulnerability Assessments evaluate water and wastewater systems' susceptibility to potential threats and identify corrective actions that can reduce or mitigate the risk of serious consequences from adversarial actions.

What is an Emergency Response Plan (ERP)

- An Emergency Response Plan is a process which describes actions, procedures and equipment which can prevent or significantly lessen the impact of terrorists' attacks or other malevolent acts on the wastewater system.



[VA's and ERP's: So What!?]

- Collecting dust, or, improving the system
- Local initiative as well as the national program need to be effecting change in order to improve the utility
- CONTINUOUS CHANGE is the price of vigilance



Mich Dept of Community Health – MiHAN

- Center for Disease Control (CDC)
- MiHAN: Michigan Health Alert Network
- Internet Web based health monitoring database and emergency comms system
- Tracks local health issues: e.g., pharmaceutical/medicinal sales and hospital emergency rooms admissions

[Table Top Exercises]

- TTX's = table top exercises

[TTX grant: Concepts]

- Hopes and Fears
- Bootstraps
- Hearts and Minds
- Relationships
- Partnerships
- Uniforms
- Lessons Learned



TTX's/FTX's

- TTX's: Table top exercises
 - Put faces to names and develops local experience
- FTX's: Field training exercises
 - Equipment mobilized and used
 - Usually involves private stakeholder
- Suggest annual exercise
 - 'use it' or 'lose it' concept – commitment to emerg. response integrity



TTXs : objectives

- Increase Awareness
- The objective of the exercise is to bring key public water and wastewater personnel together, along with key public safety (police and fire dept) officials, at key water and wastewater treatment plants to use and ***evaluate the facilities' existing emergency response plan/contingency plan for possible revisions.***

[TTX's : Objectives [continued]]

- Policies and procedures would be reviewed and the facilities' personnel and public safety (**police and fire**) officials would gain experience in responding to exercise scenarios and would be more comfortable working together in the event of a real incident.

Public Water System local emergency planning process

- Public water and wastewater officials need to be a part of the community police, fire, and hospital emergency response activities associated with the local emergency planning.

TTX concept: Hopes and Fears

- **Hope** that community finds doing a tabletop exercise useful and that they will do a TTX annually
- **Fear** that community will find doing a TTX a waste of time

[TTX concept: Bootstraps]

- No one will pull your own bootstraps up for you !

■ You have
to do it !!!!

TTX concept: Hearts and Minds

- There are more people in the world.
- What's in their hearts and minds?

[TTX concept: Relationships]

- It's important to establish strong useful relationships BEFORE the event
- You should have as many DIFFERENT ORGANIZATIONS around the table as are necessary to meet the need

[TTX concept: Relationships II]

- Water and wastewater officials need to be an active participant in their local emergency planning efforts of the LEPC – local emergency planning committee
- When the incident occurs, the strength of your relationships will be tested
- Put face to name and telephone number BEFORE the incident



[TTX concept: Partnerships]

- It's important to have as many partners at the table **who understand the importance of the wastewater system and are useful** to assisting your system meet its mission.

TTX concept: Uniforms

- First Responders, eg, Police and Fire Depts, will need to be used in the event of a terrorist act.
- Military, eg, the Michigan Army National Guard 51st Civil Support Team, are needed in the event of weapons of mass destruction (WMD) terrorist attack.

[TTX's: data]

- 30 TTXs at water and wastewater systems conducted between 2/1/05 and 7/21/05
- Principally based on population
- 350 officials attended who are responsible for providing drinking water to 4,953,404 of the 10,000,000 people in Michigan







TTX scenario example: disgruntled employee

- A disgruntled employee at the wastewater plant has attached something to the chlorine tank. He is upset about having to work on the 4th of July weekend.

TTX scenario example: bomb explosion

- 8 a.m. the Township Fire Department responded to a call from a school about an explosion near the school. The initial report from the scene was the explosion was centered at the Township wastewater treatment plant. All electric lines to the plant have been destroyed and the building has been leveled. There is a strong smell of chlorine in the air.

TTX scenario example: radiation contamination

- Maintenance staff discover two heavy canisters with radiation symbols on them. A pump with a hose is attached to the canisters which are discharging to the wetwell at the lift station.

TTX scenario example: chemical contamination

- A woman who runs a day care center calls the police that there is a lawn care company truck with a hose discharging into a combined sewer catch basin near the daycare center and there is no one around. She hears an engine noise from the back of the truck. There is the smell of almonds in the air around the truck.

TTX scenario example: cyber terrorist attack

- All SCADA charts go blank. There is electricity to the server but the computers are inoperable due to being 'locked up'.

TTX's Lessons Learned

- 1. CP/ERP: use to train EOC, staff, PD, FD
- 2. 800 megahertz radios allow comms
- 3. isolation/containment/investigation
- 4. If problems contact water supply
- 5. 51st CST
- 6. Reverse 911 using GIS



TTX: Lessons Learned: ERP - use it to train

- Use your Emergency Response Plan [ERP] to conduct training of your:
 - Community water system staff
 - Emergency Operations Center [EOC]
 - **Police** and **fire** departments first responders

TTX: Lessons Learned: 800 megahertz radios

- In the event of a cell telephone outage or other communications outage
- Allows for various government authorities to communicate in the event of an communications outage

TTX's Lessons Learned: The Rush to flush

- Need to know what the contaminant is BEFORE remediation
- Isolation may buy valuable time for investigation/sampling/analysis
- Containment may be useful until information is adequate to remediate

11 X's Lessons Learned:

[Wastewater Treatment Plant Problems – contact drinking water]

- If there are toxicological problems at the sewage treatment plant, staff should collaborate with the drinking water staff to determine if the problem is in the drinking water
- The sewage treatment plant is a 24/7 biological monitoring system.
- Stalked ciliates: 10 X



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WMD

Intelligence

Homeland Security

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Weapons of Mass Destruction Civil Support Teams

In a commencement address at the U.S. Naval Academy in May 1998, President Bill Clinton announced that the nation would do more to protect its citizens against the growing threat of chemical and biological terrorism. As part of this effort, he said, the Department of Defense would form 10 teams to support state and local authorities in the event of an incident involving weapons of mass destruction.

The WMD Civil Support Teams were established to deploy rapidly to assist a local incident commander in determining the nature and extent of an attack or incident; provide expert technical advice on WMD response operations; and help identify and support the arrival of follow-on state and federal military response assets. They are joint units and, as such, can consist of both Army National Guard and Air National Guard personnel, with some of these units commanded by Air National Guard lieutenant colonels.

The mission of Weapons of Mass Destruction Civil Support Teams (WMD-CST) is to support local and state authorities at domestic WMD/NBC incident sites by identifying agents and substances, assessing current and projected consequences, advising on response measures, and assisting with requests for additional military support.

The WMD civil support teams are able to deploy rapidly, assist local first-responders in determining the nature of an attack, provide medical and technical advice, and pave the way for the identification and arrival of follow-on state and federal military response assets. They provide initial advice on what the agent may be, assist first responders in that detection assessment process, and are the first military responders on the ground, so that if additional federal resources are called into the situation, they can serve as an advance party that can liaise with the Joint Task Force Civil Support.

The units provide critical protection to the force, from the pre-deployment phase of an operation at Home Station through redeployment. They ensure that strategic national interests are protected against any enemy, foreign or domestic, attempting to employ chemical, biological, or radiological weapons - regardless the level of WMD/NBC threat. They are a key element of the Department of Defense's overall program to provide support to civil authorities in the event of an incident involving weapons of mass destruction in the United States.

They maintain the capability to mitigate the consequences of any WMD/NBC event, whether natural or man-made. They are experts in WMD effects and NBC defense operations.

These National Guard teams provide DoD's unique expertise and capabilities to assist state governors in preparing for and responding to chemical, biological, radiological or nuclear (CBRN) incidents as part of a state's emergency response structure. Each team consists of 22 highly skilled, full-time National Guard members who are federally resourced, trained and exercised, and employs federally approved CBRN response doctrine.

These units derive their origins in guidance from the US Congress which stated the need to "establish and equip small organizations in each of the 44 states not receiving initial RMD (Rapid Assessment and Initial Detection) element in 1999 to provide limited chemical/biological response capability."

Units

- 1st WMD CST [MA NG] - Natick
- 2nd WMD CST [NY NG] - Scotia
- 3rd WMD CST [PA NG] - Annville
- 4th WMD CST [GA DOD DOJ]
- 5th WMD CST [IL NG] - Bartonville
- 6th WMD CST [TX NG]
- 7th WMD CST [MO NG]
- 8th WMD CST [CO NG]
- 9th WMD CST [CA NG]
- 10th WMD CST [WA NG] - Tacoma
- 11th WMD CST [ME NG]
- 13th WMD CST [RI NG]
- 14th WMD CST [CT NG]
- 15th WMD CST [VT NG]
- 21st WMD CST [NJ NG]
- 22nd WMD CST [PR NG] - San Juan
- 23rd WMD CST [VI NG] - St Croix
- 31st WMD CST [DE NG]
- 32nd WMD CST [MD NG]
- 33rd WMD CST [DC NG]
- 34th WMD CST [VA NG] - Blackstone
- 35th WMD CST [WV NG] - St. Albans
- 41st WMD CST [KY NG] - Louisville
- 42nd WMD CST [NC NG]
- 43rd WMD CST [SC NG] - Eastover
- 44th WMD CST [FL NG] - Starke
- 45th WMD CST [TN NG] - Smyrna
- 46th WMD CST [AL NG] - Montgomery
- 47th WMD CST [MS NG]
- 51st WMD CST [MI NG] - Augusta
- 52nd WMD CST [OH NG]
- 53rd WMD CST [IN NG]
- 54th WMD CST [WI NG]
- 55th WMD CST [MN NG] - St Paul
- 61st WMD CST [AR NG] - Little Rock
- 62nd WMD CST [LA NG] - Carville
- 63rd WMD CST [OK NG]
- 64th WMD CST [NM NG] - Santa Fe

Search globalsecurity.org for "Weapons of Mass Destruction Civil Support Teams"

TTX: Lessons Learned: 51st Civil Support Team (CST)

- Michigan Army National Guard
- Augusta, MI
- Fort Custer
- **ALL ERP's should have the 51st CST listed in event of terrorist attack**
- <http://www.globalsecurity.org/military/agency/army/wmd-cst.htm>

I I X: Lessons Learned: Michigan National Guard 51st WMD Civil Support Team

- Michigan National Guard
 - 51st Weapons of Mass Destruction (WMD) Civil Support Team
 - 2750 27th Street, Augusta, MI 49012 – 9205
 - Lt. Col. Clark D. Hinga, Commander
 - Cell: 269 420 3861 // direct line: 269 731 6531
fax: 269 731 6449
 - Unit: 269 731 6522
 - E mail: clark.hinga@mi.ngb.army.mil

Lessons Learned: Reverse 911

- Internet service using geographic information system (GIS)
- Makes telephone calls up to 900 calls per minute
- Numerous Internet based providers available

Mich Dept of Community Health – MiHAN

- Center for Disease Control (CDC)
- MiHAN: Michigan Health Alert Network
- Internet Web based health monitoring database
- Tracks local health issues: e.g., pharmaceutical/medicinal sales and hospital emergency rooms admissions

[FEMA/NIMS]

- DHS grant money will be assigned by regions, eg, MSP regions
- Locality needs to have taken web based course for at least NIMS 700
- NIMS = National Incident Management System
- FLOPA: finance, logistics, operations, planning, administration

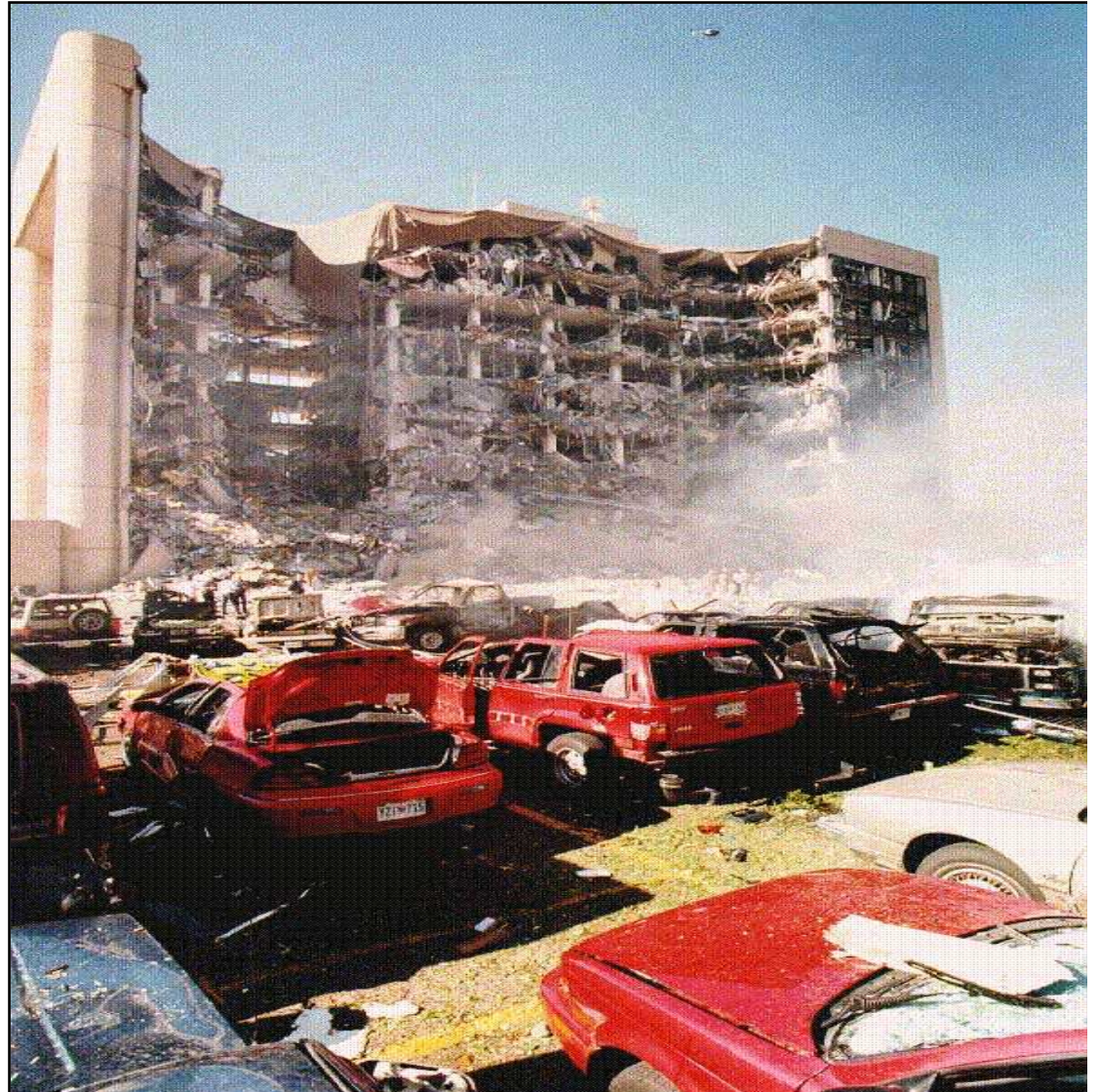
Bath, Michigan Explosion

On May 18, 1927, Andrew Kehoe detonated 500 pound of dynamite at the Bath Community Consolidated Schools in mid-Michigan, **killing 37 children and 7 adults**. Fifty others were injured. **This was the worst act of terrorism in the United States until the Oklahoma City bombing.**



[Oklahoma City Bombing]

On April 19TH, 1995, Timothy McVeigh parked a rented Ryder truck with explosives in front of the Alfred P. Murrah Federal Building complex and, at 9:02am, a massive explosion occurred which sheared the entire north side of the building, **killing 168 people.**



2005 Water Security Congress: Oklahoma City



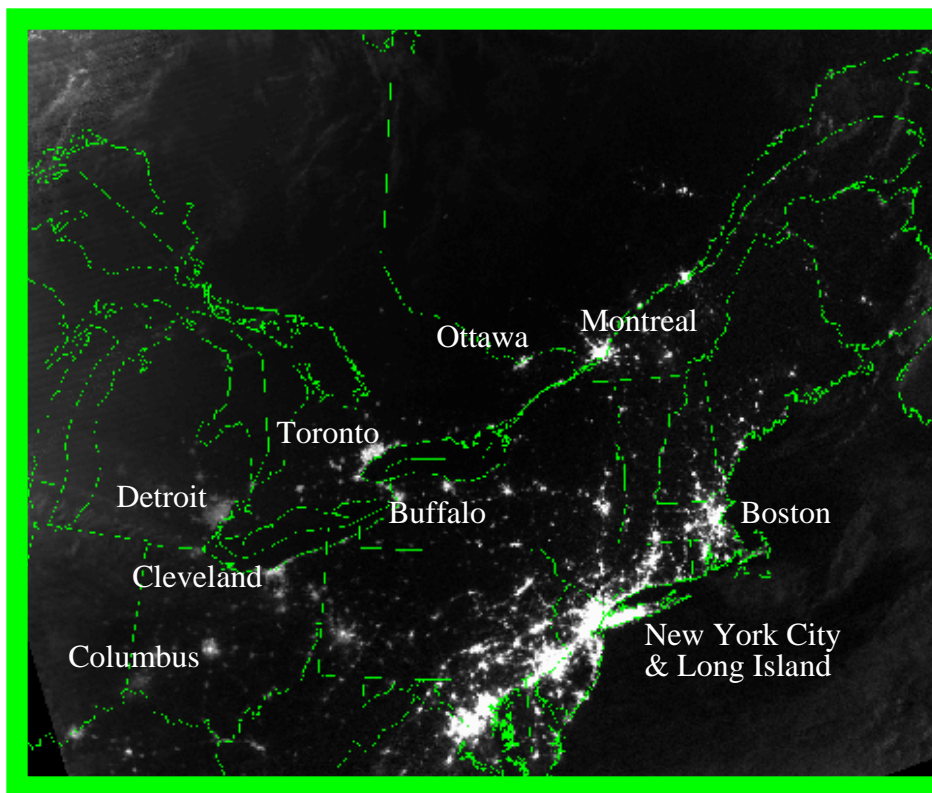
Oklahoma City National Memorial
Site of Murrah Federal Building

- Concepts at the conference
 - Canaries
 - Technology
 - Relationships
 - Evolving
 - Real-Time Monitoring
 - Department of Homeland Security

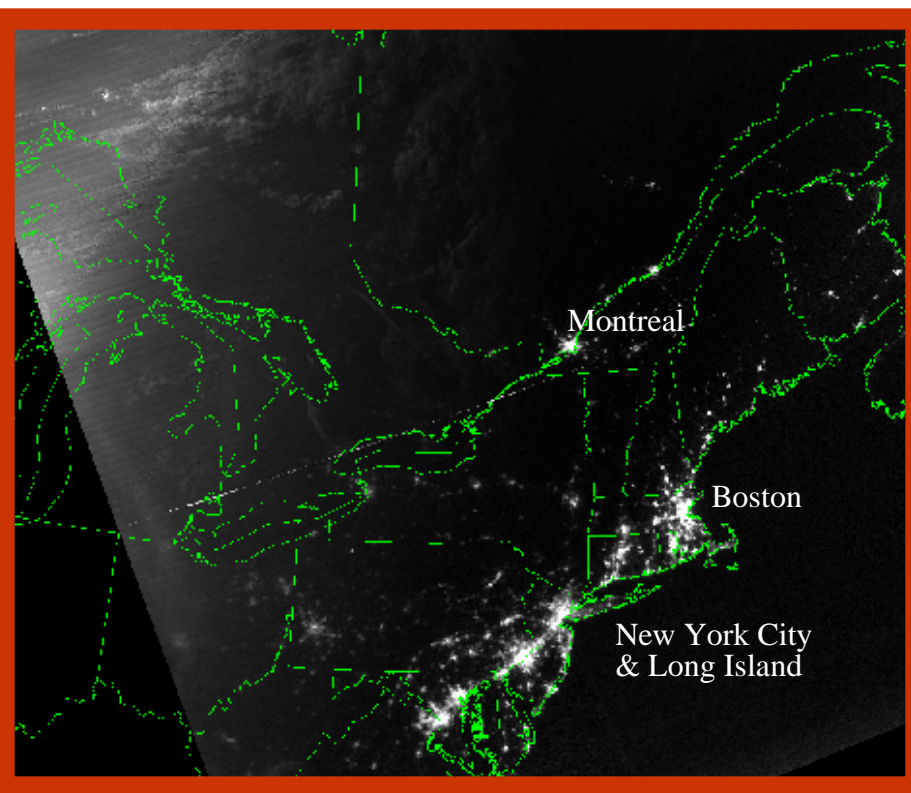


BLACKOUT 2003 – August 14 ~ 4:15 PM EDT

August 13 – 8:29 PM
~ 20 hours BEFORE



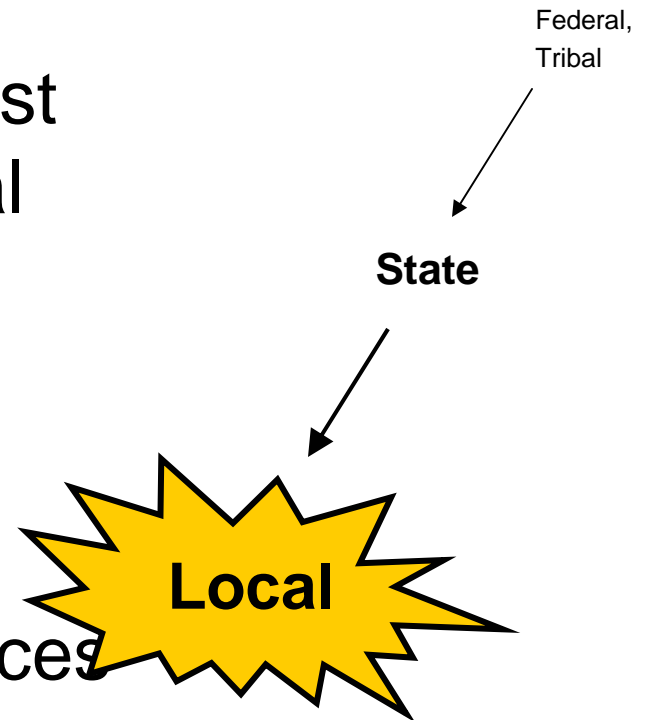
August 14 – 8:14 PM
~ 4 hours AFTER




[Local actions are the most important]

- During the power outage of August 2003, it wasn't the state or federal government that minimized the negative impact of the power outage...

It was the local utility and public safety officials who kept the services to the community going as best they could.





Ignorant men may sneer at the pretensions of sanitary science; weak and timorous men may hesitate to commit themselves to its principles, so large in their application; selfish men may shrink from the labor of change, which its recognition must entail; and wicked men may turn indifferently from considering that which concerns the health and happiness of millions of their fellow-creatures; but in the great objects which it proposes to itself, in the immense amelioration which it proffers to the physical, social, and indirectly, to the moral condition of an immense majority of our fellow-creatures, it transcends the importance of all other sciences; and in its beneficent operation, seems to embody the spirit, and to fulfil the intentions, of practical Christianity."

*"Report on the Sanitary Condition of the City of London," p. 35 by Dr. John Simon, Officer of Health, presented Nov. 6, 1849.

